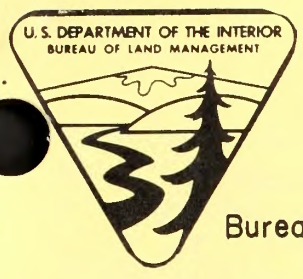


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TECHNICAL NOTE

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Date Issued December 15, 1969

Bureau of Land Management U.S. DEPARTMENT OF THE INTERIOR

CHAMISE AND CHAPARRAL
CONTROL
HEAVY DUTY OFFSET DISC

C. M. Rice

On October 10, 1968, a field trial was conducted using a Towner DB-22-3 hydraulic controlled 12 foot wide, 32 inch notched disc, 6456 pounds--weighted with additional 1000 pounds on rear gang (Fig. 1). The trial was conducted in the Sierra foothills east of Mokelumne Hill in the vicinity of Jesus Marie (SE¹₄SE¹₄, Sec. 11, T. 5 N., R. 12 E., MDBM), Calaveras County, California.

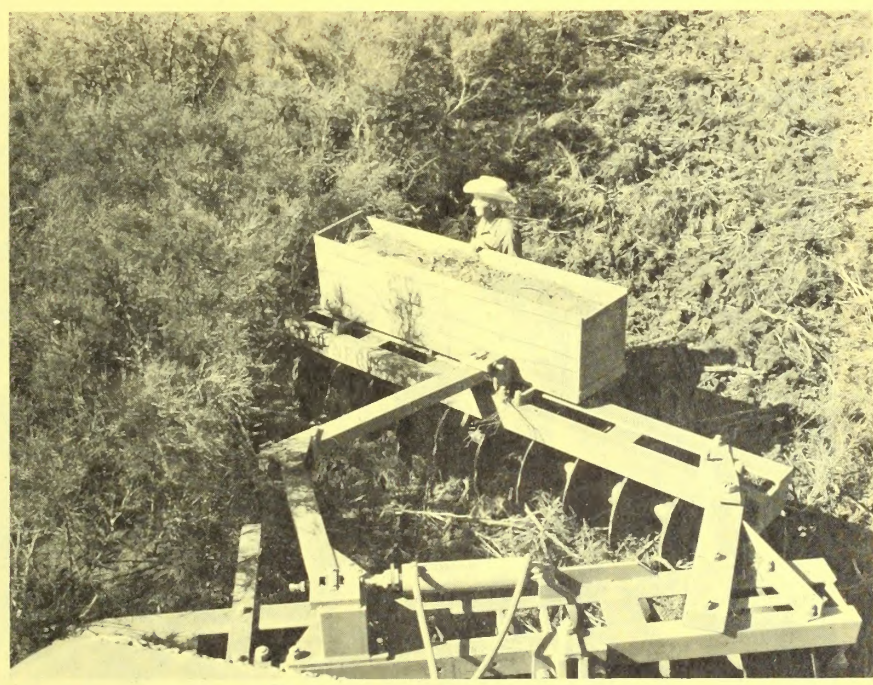


Fig. 1. Towner DB-22-3 offset disc--Medium density chamise. October 1968.

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Conditions

The area is located on a south exposure with a slope of about 7%. Soils were typical of the deep Auburn loam series. Elevation 2200 feet. Precipitation for the area is estimated at 30 inches. The Sonora station, Table 2, was used because it was the nearest station with a long term mean.

The ground was dry and hard, about normal for September and the first of October. There was no evidence of any moisture down to 18 inches. The vegetation consisted of a mature stand of chamise (Adenostoma fasciculatum) approximately 6 feet high with some wedgeleaf ceanothus (Ceanothus cuneatus), manzanita (Arctostaphylos manzanita), and blue oak (Quercus douglasii), scattered throughout the chamise. The brush was brittle and easily shattered.

There was some rock (Fig. 2) scattered throughout the disced area. The rock affected the kill only slightly (Figs. 3 and 4) but did prevent the disc from incorporating the vegetal material into the ground.



Fig. 2. Rocky area. Some survival of chamise. See Fig. 4 for area 8 months after discing.

Three days following the discing and seeding one inch of rain fell and additional rainfall occurred five days following the discing and seeding.

Ground Cover

The following gives an indication of ground cover following once and twice over discing with seeding (Table 1).

Table 1. Ground cover density seven months following discing and seeding.

Ground Cover	% Composition	
	<u>Disc Once</u>	<u>Disc Twice</u>
Blando Brome	4	14
Lana vetch	14	10
Rose clover	--	1
Perennial grasses <u>1/</u>	24	7
Salvia	2	--
Chamise	3	--
Rattail fescue	--	1
Annual (Forb)	--	1
Litter	26	33
Rock (2"+)	--	2
Bare Ground	27	31
Total	100	100

Figures 7, 8, 9 and 10 show ground cover condition after once and twice over discing and 8 months later.

Table 2. Precipitation August 1968 - July 1969

Station Year	J	F	M	A	M	J	J	A	S	O	N	D	Total
Sonora Mean	6.01	5.97	5.06	2.83	1.27	.27	.03	.02	.35	1.61	2.98	5.61	32.01
Elev. 1968								.37	.00	2.31	5.67	6.43	
1749' 1969	17.15	9.02	3.02	3.12	.00	.10	T	.00	.26				

No damage occurred by using the disc either in an open or closed position over the rocky area.

Seeding

The area was broadcast seeded by a cyclone seeder to a mixture of blando brome (Bromus mollis), harding (Phalaris tuberosa var stenoptera),

1/ Harding, Palestine Orchard and Smilo. Too immature to identify.

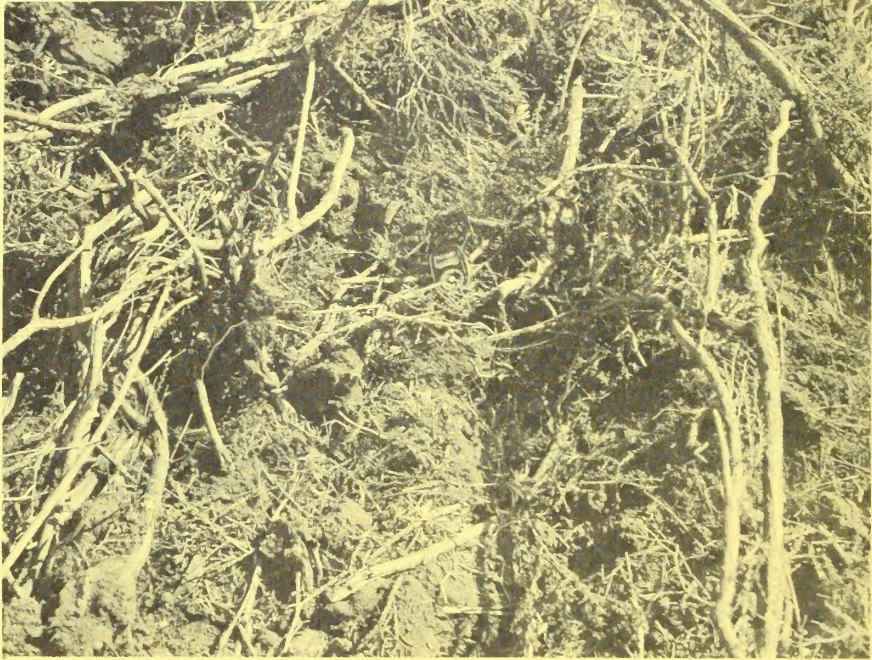


Fig. 3. Once over discing. October 1968.



Fig. 4. Repeat photo of Fig. 3 eight months later. May 1969.

palestine orchard (Dacylis glomerata), and smilo (Oryzopsis miliacea), lana vetch (Vicia dasycarpa), rose clover (Trifolium hirtum) and subterranean-clover (T. subterranean) at a rate of 8 to 10 pounds/acre. First growing season establishment is rated poor to fair. Some initial establishment was made by each seeded species with the perennial grasses, Lana vetch and blando brome doing the best. See Table 1.



Fig. 5. Twice over discing. October 1968.



Fig. 6. Repeat photo of Fig. 5 eight months later. May 1969.



Fig. 7. Once over discing. October 1968.



Fig. 8. Repeat photo of Fig. 7 area eight months later. May 1969.

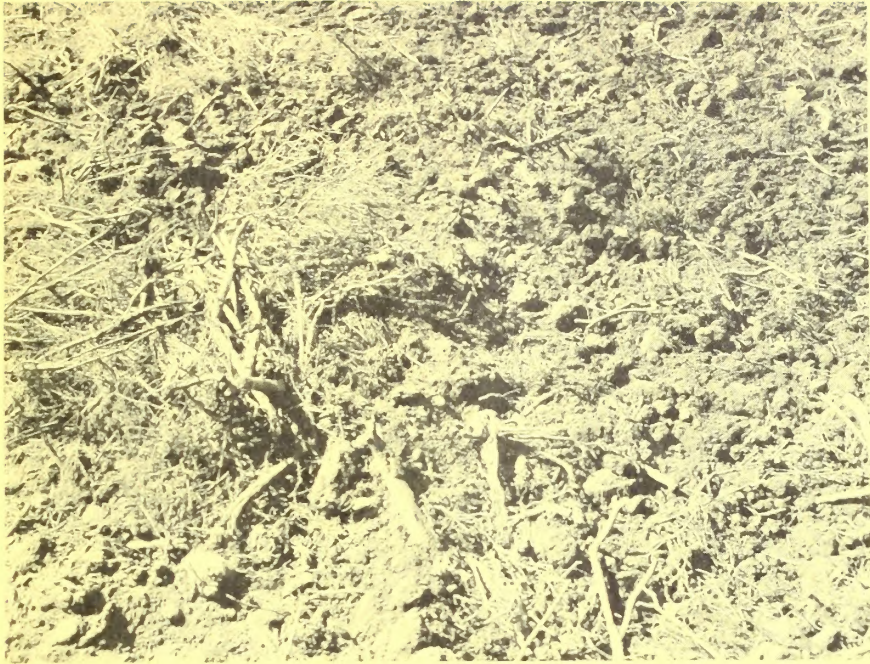


Fig. 9. Twice over discing. October 1968.



Fig. 10. Repeat photo of Fig. 9 area eight months later. May 1969.

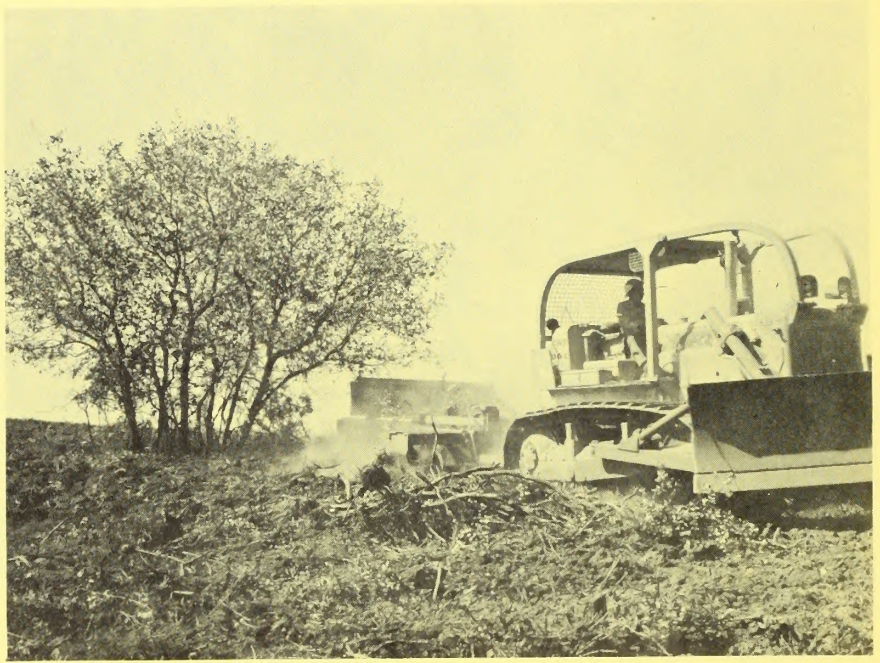


Fig. 11. Twice over discing on chamise, manzanita and scrub oak. October 1968.



Fig. 12. Repeat photo of Fig. 11 eight months later. Seeded immediately after discing.



Fig. 13. Heavy duty disc can be used to crush large manzanita bushes. Manzanita here averages 15' high.



Fig. 14. Once over crushes small material but leaves large material (9" diameter) intact.

Erosion

Erosion only occurred when with the last pass of the disc a ditch was created running down the slope. This ditch accumulated water from adjacent slopes, concentrated it and caused gully erosion.

Some surface sealing due to rainfall splash was noticed but it appears that the massive amount of vegetal material that was incorporated into the soil by discing kept the soil open allowing maximum infiltration and deep percolation.

Cost

	<u>Per Acre</u>
1 ac/hr D-8 and disc @ \$25.00/hr (twice over)	\$25.00
Helicopter, seeding	1.00
Seed--10 pounds mixture	5.50
	<u>\$31.00</u> + overhead

Conclusion

- (1) Discing can be used to substantially reduce a stand of chamise or chaparral without burning or chemical spraying.
- (2) Overland flow and erosion the first year is reduced to almost zero if the discing is properly done on slopes up to 25 percent.
- (3) Seedling establishment is slow the first year but accelerates at a rapid rate during the second year.
- (4) Chemical control of resprouting species such as yerba santa and chamise seedlings, that is normally necessary following a control burn, does not appear to be needed after a twice over discing.

A follow-up series of photographs and ground cover measurements will be made during May 1970 to further substantiate some of the assumptions made.

